LAND USE

Historical Land Use

Prior to the late 1800's, most of the basin was in the historic Pine Range -- a wildfire-maintained savannah dominated by shortleaf pine with a prairie grass (big and little bluestem, Indian grass and switchgrass) understory. The upland savannah remained relatively unsettled by white immigrants. The more fertile soils and lower topographic relief on the east side of the basin (Whitewater River and Hubble Creek) appealed to German immigrant farmers attracted to the area by Mississippi River commerce.

Land abuse began in the 1890's when large timber companies moved deep into the basin and built huge lumber mills, employed thousands of people, cut all of the pine, selectively cut the best oak and then left after the old growth timber resource had been depleted (about 1920). The harvest of the virgin forests, however, was only a prelude to the more serious watershed devastation that occurred for the next 40 years.

Many of the unemployed loggers and lumber mill workers settled on the tax delinquent lands vacated by the departing timber companies. The new tenants were poor land stewards. The remnant forest was burned each year, indiscriminate logging took most of the remaining trees, livestock over-grazed the newly converted range land and subsistence hill farms lost soil at a rate exceeding 200 tons per acre each year. One consequence of this poor stewardship was the accumulation and shifting of large gravel deposits that still clog and alter some stream channels today.

It took until the 1950's before erosive conditions in the forest watersheds began to significantly improve. Passage of an Open Range Law (required livestock fencing), changes in landowner attitudes concerning deliberate burning (fewer fires) and the acceptance of sensible soil conservation practices (reforestation of marginal pasture and row crop acreage) accelerated the recovery. Forest canopies closed, leaf litter accumulated and an understory developed.

Current Land Use

Collectively, the watershed areas of the basin can be classified as 55 percent woodland, 22 percent grassland and 19 percent cropland. However, a transition within the basin from 80 percent woodland on the west side to 75 percent agriculture on the east side provides a wide diversity of land use (Figure lu). Land use patterns have apparently stabilized. Woodland acreage has only expanded by 1 percent since 1972 (Leatherberry 1990) and cropland rotation acreage (row crop to pasture conversions) has remained near 38 percent for the past 10 years (SCS, Bollinger County District Conservationist, Personal Communication).

Most of the uplands are large contiguous tracts of oak-hickory forest dominated by a black-scarlet oak association (52%) and a secondary white oak association (24%). Succession is toward conversion to a

white oak forest type. An odd feature of the basin is the occurrence of species such as yellow poplar, beech and sweetgum that are not usually found in the Ozark uplands (MDC 1992). The tracts are considered moderately to fully stocked with proportional stand size-classes of 50 percent sawtimber, 25 percent poletimber and 25 percent seedlings and saplings (Leatherberry 1990). Livestock grazing in all basin woodlands still presents some ecological and hydrologic concerns relating to canopy closure, leaf litter accumulation and soil compaction (MDC, Perryville Forest District, Personal Communication). Only about 20 percent of the Castor River and Crooked Creek wooded uplands are grazed because of the low agricultural potential and the impracticality of fencing rugged terrain. By contrast, about 80 percent of the Whitewater River, Hubble Creek and Diversion Channel wooded uplands are grazed because of smaller tract size, gentler terrain, richer soil and a higher landowner reliance on agricultural production.

Agriculture dominates the floodplains of all major tributaries wherever topography and drainage will allow the use of farm machinery or fences. Floodplain widths, field sizes, soil types and soil fertilities generally dictate specific land use. Agriculture in the floodplains varies from small, unimproved pastures in the extreme upper watersheds to intensive row crop production in the lower subbasins. Nearly equal emphasis on improved pasture, row crops and hay fields can be expected at some point along the downstream (linear) transition of land use. Lateral land use transitions (perpendicular to stream channels) from row crop and hay fields to pasture and woodlands also occur. Most of the remnant woodlands in the larger floodplains are restricted to high relief topography or low lying wet areas.

The bottomland immediately adjacent to the Diversion Channel (from the community of Whitewater to the Mississippi River) functions as a floodway and also contains 23,000 acres of dry detention storage that protects the main Diversion Channel Levee from high flood flows (Little River Drainage District, 1989). Most drainage within the extensively rowcropped floodway/detention system is controlled with only a few miles of small, privately owned drainage ditches and levees. All remnant natural stream channels within the waterway, including the lower reaches of Crooked Creek, Whitewater River and Hubble Creek, have been channelized to improve agricultural drainage.

About 97 percent of the basin is agrarian and contains a rural population of 14,600 (12 people/square mile). An urban population of 15,500 (431 people/square mile) is concentrated in the communities of Jackson, Marble Hill and Scott City, which currently have no industrial developments that pose serious threats to local streams. The heavy industrial areas associated with the nearby city of Cape Girardeau, Interstate Highway-55, the Scott County Port Authority and a regional airport are all located just outside of the southeast corner of the basin.

Soil Conservation Projects

A Special Area Land Treatment project (SALT Project No. 37) in the 5,509-acre Malone Creek watershed (Dark Cypress subbasin) in south Bollinger County, was started in 1990 and is funded through 1995. The project addressed grade stabilization, gully erosion and stormwater runoff through the construction and fencing of small retention ponds. In all, 15 ponds totaling 24 acres have been built with 75 percent cost share funding from the Bollinger County Soil and Water Conservation District.

Landowner participation was considered good (NRCS, Bollinger County District Conservationist, Personal Communication).

The most recent SALT (project No. 127), completed in July, 1999, occurred in the 11,300-acre Greasy Creek watershed (Castor River subbasin) in east central Madison County. Goals for the project were improve pasture quality and decrease over-grazing while reducing gully erosion and providing greater stabilization for unfenced streambanks. Landowner participation was good (NRCS, Madison County District Conservationist, Personal Communication).

The basin has no completed, ongoing or scheduled projects authorized by the Watershed Protection and Flood Prevention Act, P.L. 83-566. In 1981, a Hubble Creek watershed project (PL 566 Project No. 56) was terminated in the planning phase because of low landowner interest. The ambitious 47,500 acre project design would have addressed stormwater runoff, floodwater protection and channel sedimentation through the construction of retention structures and levees and extensive channel clearing, dredging and realignment (SCS, Cape Girardeau County District Conservationist, Personal Communication). Today, such a project plan would probably be opposed by most resource agencies and conservation groups.

Public Areas

Public lands in the basin total 33,250 acres on 26 areas with 96.3 miles of stream frontages (Table 4). However, about 90 percent of the public acreage and stream mileage is concentrated in scattered state or federal ridge-top forest tracts that lack permanent flow or pools and offer few stream angling opportunities. The Missouri Department of Conservation (MDC) currently maintains nearly 10.5 miles of public frontage on fourth order and larger streams that attract bank angling, float fishing and other stream related activities (Figure pa). The MDC stream access areas at Dark Cypress Swamp, Headwaters, Maple Flats and Sweetgum have concrete boat launching ramps. Convenient canoe launching is available at Amidon Memorial Conservation Area, Marquand Access, Hawn Access and Bollinger Mill State Park.

Fisheries Division acquisition plans (MDC 1989) include the purchase of eight additional stream access sites within the basin (Table 5, contact authors for Table 5 information). The proposed Crook's Landing acquisition site at RM 33.8 on the Castor River is a high priority because it represents the furthest upstream location that is floatable during most of the year. The proposed Whitewater River site at RM 7.0 should also be considered as a high priority because of its proximity to the proposed Allenville Bridge site on the Diversion Channel. Not included in the acquisition plan is a highly desirable site in the vicinity of RM 10.0 in Crooked Creek which would complement the location of the newly developed Blockhole Access on the Diversion Channel.

Also planned for the basin, through the Stream Areas Program Plan (MDC 1988), is the eventual acquisition of six large frontage tracts (Table 5). In addition to expanding public use and access, frontage tracts can also provide the preservation of representative, threatened, remnant or critical stream habitats. Currently, a specific Streams Frontage Acquisition Plan (MDC 1993) is being

developed. The new acquisition plan will certainly include the recently identified unique reaches on the Castor and Whitewater Rivers (see Unique Habitat section). The unique Castor River reach has also been addressed in the Castor River Conservation Area Plan (MDC 1992) as a desirable area expansion. The availability of the Little River Drainage District's 4,400 acres and 11 miles of Diversion Channel frontage along the remnant Dark Cypress Swamp will also appear in the new acquisition plan.

Corps of Engineers 404 Jurisdiction

The entire Headwater Diversion Basin is under the jurisdiction of the St. Louis District. All applications or inquiries regarding 404 permits should be directed to the St. Louis office: St. Louis District USA COE, Regulatory Office, 1222 Spruce St. Telephone: 314-331-8579.

Table 4. Stream frontages on public areas in the Headwater Diversion Basin, Missouri. CA=MDC Conservation Area; AC=MDC Stream Access Area; SP=DNR State Park, USFS=United States Forest Service, MUNIP=Municipality; RM=River Mile on primary stream.

MILES OF FRONTAGE (TOTAL ALL SEGMENTS), BY ORDER											
AREA NAME	TYPE	ACRES	RM	7°	6°	5°	4°	3°	2°	1°	PRIMARY STREAM (S)
Castor River	CA	9,750	12.6		0.03			1.14	3.50	20.87	Castor R., Pond Ck.
Amidon	CA	1,152	55.7				2.60		1.61	1.66	Castor R., Stannet Ck.
Clubb Creek	CA	662								1.66	Club Creek
Coldwater	CA	4,486							1.36	10.18	Gizzard Ck., Turkey Ck.
Grassy Tower	CA	15									No streams
Grisham Tract	CA	247								0.66	Crooked Creek
Hiram Tract	CA	240								0.10	Andy's Creek
Lt. Whitewater	CA	80								0.32	Little Whitewater Ck.
Dk. Cypress	CA/AC	470	0.4		1.25				0.50	0.40	Castor River
Lake Girardeau	CA	351							0.20	0.49	Crooked Creek
Maintz	CA	804						1.69		1.43	Sandy Branch
Duck Ck. Ditch	CA	7								0.54	Water Supply Ditch
Sank	CA/AC	118	3.8				0.95			1.33	Hawker Creek
Headwaters	AC	10	3.1	0.10							Diversion Channel
Blockhole	AC	10	20.7		0.15						Diversion Channel
Maple Flats	AC	72	5.6		0.39				0.30	0.22	Castor River
Sweetgumm	AC	161	11.7		1.10						Castor River
Marquand	AC	63	40.1			0.55				0.10	Castor River
Duchesne	AC	4	56.4				0.07			0.05	Castor River
Old Plantation	AC	70	29.0				0.75				Whitewater River
Hawn	AC	81	40.2				0.87				Crooked Creek
Iron Bridge	AC	70	5.9			0.45					Bear Creek
Mark Twain	USFS	14,302	42.8				0.72	0.01	2.45	31.53	Castor R., Shetley Ck.
Bollinger Mill	SP	25	16.0		0.15				0.20		Whitewater River
Marble Hill	MUNIP		21.7			0.28	0.06				Crooked, Hurricane Ck.
Jackson	MUNIP		13.9					1.35			Hubble Ck. Goose Ck.
	TOTAL	33,250		0.10	3.07	1.28	6.02	4.19	10.12	71.54	

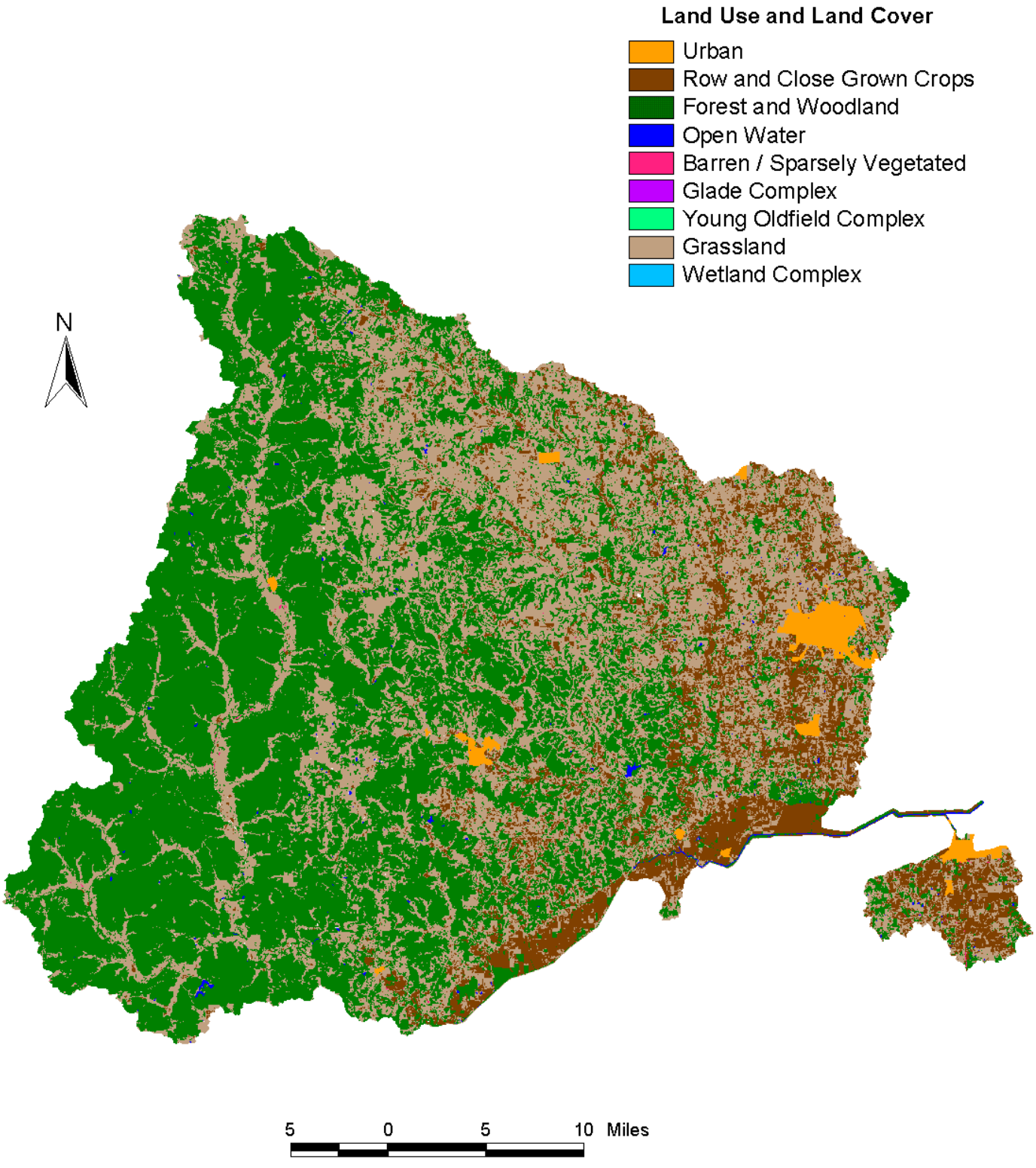

Figure lu. Land use/land cover within the Headwater Diversion Basin.

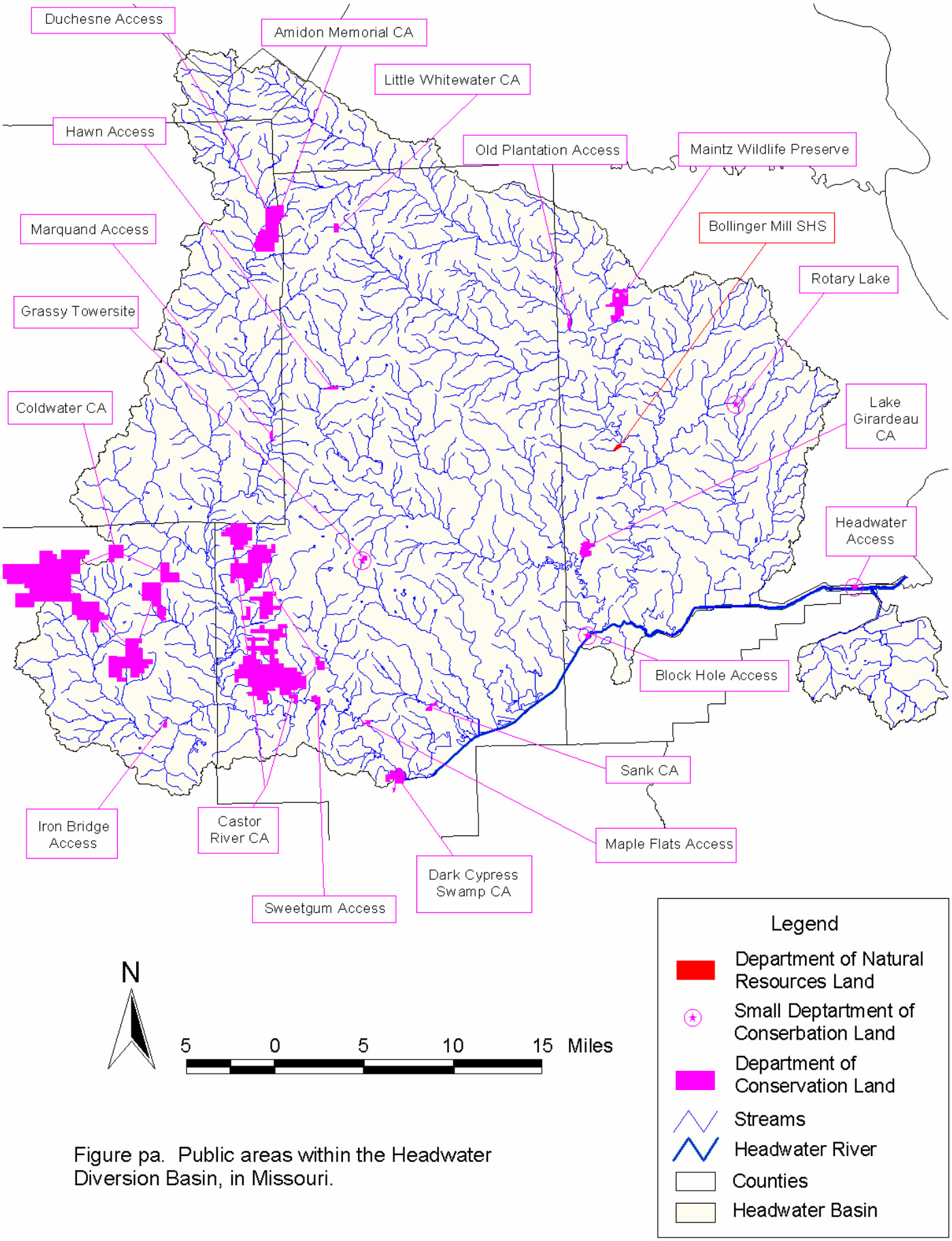

Figure pa. Public areas within the Headwater Diversion Basin, in Missouri.